

Remarks

Applicants appreciate the courtesy extended by the Examiner to co-inventor Andrew J. Curello and to Applicants' attorneys during the interview on July 15, 2008.

Applicants appreciate the withdrawal of the prior rejections under 35 U.S.C. § 103(a).

Claims 1-3, 5-7, 12-16, 22, 23, 25, 27-30, 34, 45-47, 99-114 remain in the present application for the Examiner's review and consideration. Claims 4, 8-11, 17-21, 24, 26, 31-33, 35-44, and 48-50 have been previously withdrawn. Claims 51-98 have been previously canceled.

As suggested by the Examiner during the interview, claim 101 has been amended to positively recite the fuel cell and fuel supply. No new matter has been added.

Based on the above amendment and the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding rejections and that they be withdrawn.

Rejections under 35 U.S.C. § 103(a)

Claims 1-3, 5-7, 12-16, 22, 23, 25, 27-30, 34, 45-47, and 99-113 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Franklin (U.S. Patent No. 6,824,011) in view of Murphy *et al.* (U.S. Patent No. 2,504,569). Claim 114 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Franklin in view of Murphy *et al.* as applied to claim 101, and further in view of Kojak, III (U.S. Patent No. 4,672,998).

Claims 1 and 101 are the independent claims in the remaining group of claims.

I. INDEPENDENT CLAIM 101

As was discussed during the interview on July 15, 2008, independent claim 101 is patentable over the prior art, because it is directed to a valve comprising springs wherein "the spring constant of the spring in the valve component connected to the fuel cell is lower than the spring constant of the spring in the valve component connected to the fuel supply." The practical effect is that the valve connected to the fuel cell would open first, before the valve connected to the fuel supply, so that when the fuel from the fuel supply begins to flow it has a place to flow into. This minimizes any potential for undesirable spills.

None of the art of record discloses these elements, and it would not have been an obvious design expedient to conceive such dissimilar spring constants. In the Interview Summary mailed July 16, 2008, the Examiner indicated, "Claims 101-114 will be allowed if applicant positively recites the fuel cell and the fuel supply." Applicants greatly appreciate the indication that claim 101 and its dependent claims 102-114 are allowable, and have amended claim 101 to positively recite the fuel cell and fuel supply.

II. INDEPENDENT CLAIM 1

Applicants respectfully traverse the conclusion that the claimed invention is unpatentable under 35 U.S.C. § 103(a). A person having ordinary skill in the art at the time of the invention would not have been motivated to employ the complex valve assembly disclosed in Murphy *et al.* with the fuel cell system disclosed in Franklin to arrive at the invention recited in either pending independent claim 1.

First, the relevant time frame for an analysis of obviousness is the time of invention. See M.P.E.P. § 2141. Applicants submits herewith a declaration of co-inventor, Mr. Paul Adams, under 37 C.F.R § 1.131 to show that the date of invention of the present invention is as early as February 18, 2003.

Rule 1.131(b) requires that (i) the invention be conceived and reduced to practice before the effective date of the reference, or (ii) that the invention be conceived before the effective date of the reference coupled with due diligence prior of this effective date of the reference to a subsequent reduction to practice or to the filing date of the application.

Mr. Adams' declaration shows that on February 18 and again on February 19, 2003, he conceived of the main thrust of the present invention. The hand sketches made on those dates matured with minor revisions into Figures 1(a)-1(c) and Figures 2(a)-2(b) of the present application, respectively. (Adams Decl. ¶ 7). Additional design work was completed on March 15 and March 17, 2003. (Adams Decl. ¶¶ 8-9, 12). Work related to the preparation of the present application began from April 3, 2003 continually and with due diligence with prior art search(es) and multiple drafts, and culminated with the filing of the present application on July 29, 2003. (Adams Decl. ¶¶ 10, 11, 13-15).

Additionally and importantly, engineering works conducted in Mr. Adams' lab parallel the patent drafting work. An early detailed computer design of the inventive valve was completed as early as May 29, 2003, as shown in six engineering drawings of the components of the inventive valve (dimensions were redacted from the drawings). (Adams Decl. ¶ 17). A set of three engineering drawings showing the opening and closing sequences of the inventive valve was sent to the undersigned attorney on or before June 17, 2003, and these drawings became Figures 7(a)-(c) of the present application. (Adams Decl. ¶ 18). Parts were ordered on or about August 19, 2003. (Adams Decl. ¶ 19).

Hence, the invention was conceived as early as February 18, 2003. Actual reduction to practice occurred as early as May 29, 2003 and constructive reduction to practice occurred as early as July 29, 2003.

The date of invention is therefore at least as early as February 18, 2003, and the following analysis of non-obviousness is presented relative to this date and with respect to prior art that predates this date of invention.

The seminal decision on the law of obviousness is *KSR International Co. v. Teleflex Inc. et al.*, 550 U.S. ___, 127 S.Ct 1727, 82 USPQ2d 1385 (2007). The *KSR* decision overruled the rigid application of the "teaching, suggestion, or motivation" test under Federal Circuit case law, *Id.* at 1741-42, and changed the way patent applicants and patent examiners have conducted obviousness analysis. The *KSR* decision also reaffirms the holdings of *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966), which requires the determination of the scope and content of the prior art and the differences between the prior art and the relevant claims. *Id.* at 1734. Then, a determination of whether this difference is obvious to one of ordinary skill in the art. *Id.* Secondary considerations can be utilized to give light to the circumstances surrounding the invention. *Id.*

Moreover, the *KSR* decision in at least two instances provides important guidance to patent applicants and examiners.

First, the Court states that

if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way,

using the technique is *obvious unless its actual application is beyond his or her skill*.

Id. at 1740 (emphasis supplied). This means that patent applicants and examiners must look at the “actual application” of a known technique of a device to similar devices. In the present office action, the examiner is applying the known technique disclosed in the Murphy reference, which involves a coupling for an inter-component seal (38) being provided between two cooperating valve components (11 and 12) to be used in railroad passenger trains’ air-conditioning systems, to the device disclosed in the Franklin reference, which involves connecting a valve (44) on fuel supply (40, 42) to valve (52, 54) in fuel cell (10).

The technique disclosed in Murphy has been known to the public and those of ordinary skill in the art as early as 1948, when the application for that patent was filed. Yet, present-day designers and engineers of fuel cell devices and their fuel supplies for electronic devices did not use Murphy’s railroad coupling technique.

A case in point is the Franklin reference itself, which was filed on April 18, 2002, or about eight months before the date of invention of the present invention. The inventor of this fuel cell system did not include the technique known in the railroad art in his fuel cell design.

Another example is the Prasad reference (US 6,924,054), which was filed on October 29, 2001 or less than two years before the date of invention of the present invention and was cited in the office action of December 14, 2007. Prasad, which is related to fuel supplies and fuel cells, does not use two sealed valve components, but uses one valve and one hollow tube.

Another example is the Yonetsu reference (US 6,506,513), which was filed in August 2000 or less than three years before the date of invention of the present invention, and was submitted as reference “CH” in an IDS dated February 2, 2005. Yonetsu, which is also related to fuel supplies and fuel cells, also does not use two sealed valve components. (See Figures 10A-12).

Another example is the Scheifers reference (US 5,723,229), which was filed in July 1996 and was submitted as reference “AZ” in an IDS dated February 26, 2004. Scheifers discusses portable fuel cell devices and fuel supplies, but again does not use the railroad coupling technique disclosed in Murphy.

There are other examples of valves used with fuel cells and fuel cell supplies that are of record and predate the February 18, 2003 invention date, but none utilized the railroad coupling technique discussed in Murphy. The examiner is invited to review these references.

Applying the teaching of the *KSR* decision of whether the “actual application” of a known technique (Murphy’s railroad coupling) to the valves on fuel cell and fuel supplies for electronic equipment is “beyond [one of ordinary in the art’s] skill” can lead to only one conclusion: despite the fact that Murphy’s railroad coupling is known for over 50 years, designers and engineers in the field of fuel cells and fuel supplies did not or could not implement Murphy’s railroad coupling in fuel cells and electronic equipment. The facts-on-the-ground dictate that the combination of the Murphy reference to the Franklin reference cannot render claim 1 obvious.

Second, after it has already reached its conclusion or legal holding, the *KSR* court faulted the losing party for not bringing up an argument that, if properly preserved for appeals, would have been entertained by the Court. *KSR* at 1743-44. This argument is that the prior art references cannot be combined because the designs in one or both references do not allow the combination of the designs. *Id.* More specifically, the Court stated that “[one prior art reference] could not be used to solve ‘the problems addressed by [the claims in the patent-at-issue] to provide a less expensive, more quickly assembled, and smaller package ... with electronic control.’” *Id.* at 1744 (emphasis supplied).

As discussed by Mr. Curello at the interview, railroad couplings and other similar heavy industrial machineries are expensive, heavy, large and durable components. They cannot be directly adapted to fuel cells for electronic devices, which required miniaturized, precise, inexpensive components. A valve that is conventional for heavy industrial machineries would not and could not be conventional for electronic devices. There is no reason to believe that railroad coupling can be made less expensive and be miniaturized to be used in electronic equipment or fuel cells. This conclusion is supported by the facts-on-the-ground discussed above. A number of designers and engineers in the field of fuel cells and fuel supplies when faced with designing valves for fuel cells and fuel supplies did not refer to railroad couplings.

For this second, additional reason, claim 1 is not obvious over the combination of Franklin and Murphy.

Additionally, this conclusion remains valid even if Murphy's railroad coupling is replaced by the other heavy or industrial components disclosed in the art of record, e.g., Lechner US 4,911,194 (couplings for liquid petroleum gas (LPG), industrial lift-trucks or gas grill), Wong US 5,634,505 (valve for race cars), Brown US 4,327,770 (refilling valves for outboard motors), Wilder US 5,564,471 (fuel hose breakaway unit for gas stations), and Neely US 2,865,410 (rotatable valve for starting internal combustion engines).

Conclusion

All other remaining claims depend directly or indirectly on independent claims 1 and 101 and are therefore presently patentable. Applicants reserve the right to further support the patentability of the dependent claims, should that becomes necessary.

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

It is not believed that any fees are required with the submission of this response other than a fee for one-month extension of time. However, if any other fees are due, the Commissioner may charge appropriate fees to The H.T. Than Law Group, Deposit Account No. 50-1980, and if any additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. § 1.136(a).

Respectfully submitted,

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